

Claim 14 (former CLAIM 1, now improved)

The CLEAN PROCESS OF PROCESSES invented for manufacturing non carcinogenous zero polluting eco fuels, derived from gas hydrates, fuel alloys and very inexpensive electricity, generated for the purpose from the special BEZENTROPIC POWER PLANTS of this invention, all engineered to eliminate in full the smoke, the carcinogens and the CO₂ to confront the illnesses caused by them and eliminate the menacing GREEN HOUSE EFFECT in order to return earth the crystal clear air and environment, of the biblical times, where the *gas hydrates, inventor's fuel alloys and the inexpensive electricity derived from his Bezentropic Power Plants* are main primary ingredients of this comprehensive ecological Claim and eco fuels where the gas hydrates as primary chemical feedstock are prospected for, mined and processed to obtain from them the necessary NATURAL GAS, used as a secondary chemical feedstock to derive from it all eco fuels by the absolutely non polluting technology of the invention, relaying economically –and to some degree chemically– on said inexpensive electricity, on account of which the claimed Clean Process of Processes became practical, and working smoothly the following way:

using a suitable boat and a Geostatic Positioning System (GPS), an operator–geophysicist first proceeds with the development of a system of geophysical prospecting profiles, in the open see, where is supposed (from preliminary testing) to look for and discover the necessary gas hydrates doing that by using, as a minimum, the following equipment: said GPS, a portable electric generator, an electric switch connected to a reel, on which is wound a long cable together with a long hose, having marks at every meter of its length and ending with a small, 'frogman's like bell' housing a powerful electric spark plug, connected with said cable and operated by the operator, through said switch, who stops the boat at every 100 meters or so upon said profiles (according to the desired geophysical precision) takes the coordinates of the stop with said GSP monitor, submerge the bell till the bottom of the see, measures the depth of of the see and then, with the help of the spark plug, the cable, the switch and the electric generator in the boat provokes one or more powerful underwater electric explosions (thunders) at the bottom of the see causing the decomposition of the gas hydrates (if they exists there), which liberates NATURAL GAS from them which is collected by the bell and sent to the operator in the boat, through said hose connecting the bell with the boat; then, the operator ignites the gas to be sure that it is natural gas and not CO₂, saves an amount from the gas for further chemical analysis, measures the depth of the see bottom, enters all obtained data in his prospecting book and then go to another point of the geophysical profiles to perform the same measurments and repeating them upon all points of the system of the

geophysical profiles prepares a GEOPHYSICAL MAP depicting the existence or the non existence of gas hydrates upon the selected area of the see bottom, and when desired, further improving that map by photographing the area of the discovery by an underwater color TV camera; then, upon discovering the desired gas hydrates, the needed natural gas is extracted from them essentially by the same above described new geophysical technology (process) but, of course: instead said prospecting boat, small electric generator and small frogman's bell, one must use industrial see platform, powerful –on the platform– BEZENTROPIC POWER PLANT (described further in this claim to produce affordable electricity), large reel, rig, bell, hose, spar plug, and so on, to perform large underwater thunders by electric short circuits, in order to obtain and collect industrial quantities of natural gas from said gas hydrates, as primary chemical feedstock to obtain from there the claimed PLURALITY OF ECO FUELS obtained the following way:

(a) the so obtained natural gas is directed to the water cooled combustion chamber of another large *Bezentric Power Plant* (BPP) and combusted there electricity by an extraordinary process of full heat to electricity conversion of up to 90% or more efficiency while the generated CO₂ Green House Gas is separated from the nitrogen (remained from the combustion) and directed to the see water, where it is combined with the alkali earth ions there and settle on the bottom of the see as sediment material, while the by-produced nitrogen is saved to be blended with 4% to 40% hydrogen to convert the hydrogen from dangerously explosive gas to kind of *Quieted and safety fuel blend* ('*quieted*' like the *quieted oxygen of the atmosphere*) suitable for safety transportation by pipelines, by car tanks and for safe home and industrial applications, as well as fuel for car engines, where the necessary hydrogen (for that fuel blend) is derived via electrolysis of the water with the inexpensive electricity generated by the bezentric power plants of the invention, also

(b) converting the inexpensive hydrogen to calcium hydride (CaH₂) which is a convenient compound for hydrogen storage 'in solid state', from where the hydrogen is easily back regenerated (when needed) via hydrolysis with room temperature water, by-producing also calcium hydroxide Ca(OH)₂, which is another valuable material and when desired, can be back recycled to CaH₂, which storage reactions are almost not practiced now on account of the expensive hydrogen; and when desired the storage of the hydrogen 'in solid state' can now be performed, even more conveniently, as fuel for cars, via absorption by fullerenes' made carbon nano tubes, having the same –volum by volnm– energy capacity as that of cars' gas tanks; and from this inexpensive hydrogen of the invention can be produced also the IONIC FUELS comprised in the plurality of the eco fuels, very suitable for space and terrestrial JET PROPULSION, made the following way:

(c) using said by-produced nitrogen and the inexpensive hydrogen of the invention, the manufacturer produces first ammonia and ammonia compounds using the well known and efficient method of HABBER and BOSH, the preference being given to the AMMONIUM NITRATE for it is a solid substance easier for safety storage as solid eco fuel and because: when the ammonia, the ammonium nitrate –as well as other ammonia compounds– are cracked with heat, at over 600°C, or by electric arc, they liberate IONIC PLASMA consisting of NASCENT HYDROGEN and NITROGEN, and I found that said nascent gases have about 30 seconds duration of time, till their IONS recombine to molecular hydrogen and nitrogen, which is more than the necessary time to use 'IN SITU' the plasma as perfect inexpensive IONIC ECO FUEL, for IONIC JET PROPULTION, and additionally to that: since the gas hydrates often contain H₂S and CS₂ which are polluting gases, to get rid of that sulfur (S) then: the fuel manufacturing must be modified

(d) by replacing the water cooled combustion chamber of the bezentropic turbine with a classic type steam generator but, modified by FLUIDIZED BED COMBUSTION of the sulfur containing NATURAL GAS, in the presence of limestone gravel, thus, eliminating the SULFUR by converting it into valuable, pure calcium sulphate (gypsum CaSO₄) and converting the (further described bezentropic turbine) from turbine using as working body a blend of 'gas plus steam' to pure STEAM BEZENTROPIC TURBINE using either OPEN WATER CYCLE or FREON STEAM CLOSED SYCLE, while part of the natural gas obtained from the gas hydrate when is pure or purified is converted also to the valuable

(e₁) ACETAL FUEL, of the plurality of the eco fuels, never containing carcinogens nor causes SMOKE but, of course, is yielding CO₂ during its combustion in the cares, but lesser than the gasoline, (because it contain more hydrogen and lesser carbon) and therefore, must be used as car fuel during the unavoidable intermediary period till the mass appearance of of electric and hydrogen cars, since there are now –in the world– more than 1 billion gasoline and diesel cars and it may take more than half a century to they to disappear in full, hence, during that time of our civilization it is imperative to use both the ACETAL FUELS and also light liquid hydrocarbone limited to the pentane iso pentane and hexane which can be easily obtained, through acidolysis (slightly aside hydrolysis) at about 80°C from the FUEL ALLOYS of my American patent No 4,110,082 yielding mostly blend of methane and other gaseous hydrocarbons –but not the acetylene– all convertible to *acetal fuels*, *trough CATALITIC PARTIAL OXIDATION the following way:*

into a special continuous water cooled, tubular shaped, chemical reactor is introduced the natural gas or other hydrocarbons, where they are submitted to said partial catalytic oxidation with insufficient air or oxygen (by-produced from said electrolysis)

at a controlled temperature of $450^{\circ}\text{C} \pm 20^{\circ}\text{C}$ and at atmospheric pressure to no more than 40 atmospheres, in continuous fluidized bed condition, in the presence of limestone granules –when the hydrocarbons contain sulfur, in order to neutralize the sulfur to gypsum– and in the presence of a catalyst consisting of 99,999% pure electrolytic copper, made in shape of spiral coils, where the so obtained partial catalytic oxidation initially produces an intermediary 'master blend', of roughly equal amounts of aldehydes and alcohols plus insignificant amount of ketones (mainly acetone), all performed by the reactor in only 0,2 to 0,4 parts of the second, where the aldehydes consist mainly of formaldehyde with lesser amount of acetaldehyde and the alcohols are represented mainly by the methanol and lesser amount of ethanol and other alcohols where the ethanol constituent could be somewhat increased, by adding to the catalyst also zinc oxide, after which

(e₂) the so obtained intermediary 'master fuel blend' is transferred into a continuous tubular cooler, cooling down said blend, in the interval of 50°C to 60°C , which is condensing the alcohol stem down to liquid alcohols, to which in the mean time is sprinkled 10 to 15% water to better absorb the still gaseous aldehydes by the alcohols after which the obtained liquid blend is passed to another continuous tubular reactor where is introduced another catalyst –of the catalyst plurality– consisting of strongly acidic ion exchange resins, or zeolites, doped with CaCl_2 , which converts the 'liquid master blend' to a "bouquet" of acetals fuel of very high octane number (O.N.), ranging from 123 up to 150 O.N., which after distilling the fuel from the initially added water, but, purposely let there to remain up to no more than 8% water, not needing to separate the different acetals of the blend, one from the other, because: similarly to the gasoline, the "bouquet" of the acetals is better performing, as engine fuel and solvent for paints, than the individual acetals, and has much more agreeable smell than any other liquid fuel, and such fuel do not produce smoke nor has any carcinogenes; and on the other hand,

(e₃) since only half of the aldehydes –in said master intermediary fuel blend– are sufficient to convert all of the alcohols –contained there– to acetals, the other half is passed, at room temperature and at atmospheric pressure, through the synthetic ZEOLITE SZM-5 as catalyst –having a pore size of only 5,5 Angstroms– that converts the extra aldehydes to low boiling hydrocarbons consisting mainly of isopentane and hexane which is no carcinogenes and no sulphure containing kind of aviation gasoline not having so bad smelling, which can be further improved by blending it with acetals, which converts it to smokeless engine fuel and to all above acetal fuels can be added more aroma as follows:

(f) the higher aldehydes and alcohols such as the iso-propanol, butanol and pentanol aldehydes and alcohols are possessing perfume like fragrance but, since such

alcoholes and aldehydes are expensive to be used as fragrant acetal fuels, such fragrance can be derived from the abundant gaseous hydrocarbon blend, yielded by the mentioned acidolysis of the FUEL ALLOYS, containing normal and iso propane and butane, absolutely not containing sulfur and phosphorus, which are giving the bad odor of the gasoline, trough their awfully smelling mercaptans and phosphine compounds; hence, one can avoid them and produce fragrant acetal fuels if as chemical feedstock to the above described catalytic partial oxidation process –producing the intermediary 'master fuel blend' of aldehydes and alcohols– are used the hydrocarbons obtained from the fuel alloys and

(g) naturally to do all above economically feasible, the main thing which must be done is to produce enough inexpensive electricity –requiring the following plurality of BEZENTROPIC POWER PLANTS– all based on the newly discovered, by this inventor, UNIVERSAL LAW OF SPONTANEOUSLY STIMULATED COLINEAR (one directional) MOLECULAR ORDER of VECTOR–IMPULCES, generated FROM THE MOLECULAR SCALAR DISORDER OF THE ENTROPY, by natural or, by man maid STIMULANTS, on account of which –when I discovered that law, I named it shortly: LAW OF THE BEZENTROPY, coined after the Bulgarian word BEZ (meaning "without") and the classic scientific word "ENTROPY", discovering also that both laws are existing simultaneously and independantly, thus, both of them contributing to the realities of the universe, BUT THAT DIFFERENTLY FROM THE LAW OF ENTROPY, the LAW OF THE BEZENTROPY allows –due to its order– practically FULL CONVERSION of the HEAT INTO WORK and ELECTRICITY and MORE:

it allows also EXTRACTION OF –FREE OF CHARGE– HEAT, WORK AND ELECTRICITY FROM ONE ONLY RESERVOIR OF HEAT –such as from the immense atmospheric air –which IS ABSOLUTELY PROHIBITED by the LAW OF DISORDER (the ENTROPY)– but, indeed is ALLOWED BY THE LAW OF THE BEZENTROPY and is WORLDWIDE PRACTICED by MOTHER NATURE, repeating that at every instance; and TUTORED me how I ALSO CAN DO THE SAME, and HOW MOTHER NATURE CREATED ALL LIVING BEINGS –all of them biological forms of heat engines, DEFYING THE ENTROPY, since all of them are living and working without temperature gradients– and therefor: prohibited to exist by the ENTROPY, BUT, ALLOWED TO EXIST BY THE LAW OF THE BEZENTROPY, WHICH IS THE SECOND LAW OF THE BEZENTROPIC THERMODYNAMICS, CREATING BESIDE ALL LIVING BEINGS ALSO THE CLOUDS, THE RAIN, THE WATERFALLS –USED BY THE HYDRAULIC POWER PLANTS– THE IRRIGATION OF WORLD etc., DEFYING THE LAW OF ENTROPY AT EVERY INSTANCE and so on; on which ground I invented the plurality of the BEZENTROPIC POWER PLANTS of this ECOLOGICAL PROCESS OF PROCESSES for better destiny of the people as follows:

(g-1) in the beginning I noticed that it is wrong to believe that the classic hydraulic

power plant are purely hydraulic, because: what is causing their (indispensable) waterfalls is the raining on the mountains –caused by the clouds– but, the clouds are caused by the 'latent heat of vaporization' of the water–to–vapor which elevates the clouds up to the mountains –without temperature gradient at any point of the elevation of the water vapor till the clouds; hence, all that gave me a hint that the the so named HYDRAULIC POWER PLANTS are actually UNIQUE TERMO-HYDRAULIC POWER PLANTS DEFYING THE ENTROPY by using its unique (mixed) TERMO-MECHANICAL CYCLE, which is missed by the present level of the science and technology; hence, observing all that I decided to study and scrutinize it and related to that to scrutinize also the law of ENTROPY (of CLAUSIUS) and especially LUDWIG BOLTZMANN'S 1900 discovery that the ENTROPY is not a perfect law but, only a STATISTICAL ONE, governing the molecular disorder in the world, which is not at all valid for miniature NANO VOLUMES of gases or steams, and concerned only for large and medium volume of molecules and when I investigated all that, I DISCOVERED that THE ENTROPY IS NOT VALID ALSO FOR MEDIUM (engine size) and for as large volumes like the ENTIRE ATMOSPHERE, nor to the RINGS OF SATURN, WHENEVER SUCH VOLUMES ARE OCCUPIED BY COLINEAR ORIENTED MOVING MOLECULES OF SPONTANEOUS ORDER, CHARACTERIZED BY VECTOR-IMPULSES (of gases, ions and steam) one of the several example for such order being the formation of the clouds and the rain stemming from said 'latent heat of vaporization of the water', the heat which is directly converted to potential energy, during the elevation of the vapor to the clouds, causing the mountain rain and the waterfalls, by the audacious 'spontaneous natural stimulation of of the MOLECULAR DISORDER INTO MOLECULAR ORDER OF THE BEZENTROPY, working as follows:

the natural stimulation of MOLECULAR ORDER from the MOLECULAR DISORDER of the ENTROPY in this particular case is concurrence of (1) the Partial Pressure Law of gases, the steams and the ions (stating that: whenever a volume is occupied by a mixture of different gases and/or steams, each of them behave like being alone in the volume; and contribute to the common pressure only by its own pressure equal to the pressure which would be such as being alone in the volume), (2) of the 'latent heat of vaporization' of the water, (3) of the well known ARCHIMEDES PRINCIPLE, (4) of the adiabatic process, (5) of the reversible water condensation process and (6) of the 'Energy Conservation and transformation law, all of them working together as 'aggregate' stimulus as follows:

as is well now the water and all evaporable liquids evaporate at any temperature, regardless of theirs boiling temperatures; thus, the water boils at 100°C but evaporates at any atmospheric temperature and the ice even sublimate; hence, the existing steam tables

display that when 1 kg water (equal roughly to 1 liter) evaporates at 100°C, it absorbs about 540 kcal/kg 'latent heat of vaporization' and that inflates the water to 1673 liters of steam of specific gravity 0.5977 kg/m³ making the steam lighter than the air, because 1000 liters air weight 1.033kg and more: when the water evaporates at lower temperatures its specific gravity go further down, for example at temperature of 50°C it is 0.083 kg/m³ and at 0°C is only 0.00485 kg/m³, telling that the steam is less weighting than the air at any temperature, on account of which as soon as the water evaporate (from the oceans or from the crust) the Archimedes principle starts immediately to elevate it in the direction of the clouds and MORE: because the vaporization and the elevation are conducted at atmospheric temperature, there is no temperature gradient between the air and the vapor, meaning that there is no heat exchange between them and meaning also that the colinear order of the elevation is conducted in adiabatic conditions not affecting the air, which remains not elevated and in disordered molecular state (as allowed by the 'law of the partial pressure of the gases and steams mixtures' governing the air and vapor mixture) but, since any elevation at any weight creates POTENTIAL energy –which must respect the energy conservation law– and because the adiabatic conditions of the ordered elevation does not allow input of energy from the air, the energy of the elevation is taken from the internal energy of the vapor, which in accordance with the kinetic theory of the gases and the steams originally the internal energy is DISORDERED (multi directional) form of kinetic energy hidden within the 'mean free path' of each molecule vibrating and residing there in shapes of a mini bubbles of energy continuously feeding the elevation thus, gradually and directly converting the hidden internal energy to potential energy of the elevation on account of which said tiny bubbles of internal kinetic energy start to get gradually contracted –contracting said 'mean free path' to create the vector of the elevation and when the invisible bubble arrive till the clouds many of them get contracted into tiny water droplets of fog, thus, creating the clods, then, at suitable meteorological conditions leading to sudden adiabatic lowering the temperature and meeting condensing dust particles from the air, the fog of the clouds condense into rain, the liberated heat of condensation warms the remained cloud and further elevate it for longer travel where at suitable meteorological starts another raining, and that way the nature irrigates the entire earth and creating the potential energy of the mountains lakes and springs from where starts the WATERFALL used by the HYDRAULIC POWER PLANTS, all this displaying that the elevation of the water vapor, up to the clouds, promoted jointly by aggregation of the above mentioned 6 natural laws –acting jointly as natural STIMULUS converting the originally DISORDERED molecules of the vapor into VERTICAL SPONANEOUS ORDERED

ELEVATION of COLINEAR VECTOR-IMPULSES, is proceeding without temperature gradient and making DIRECT CONVERSION OF THE LATENT HEAT OF THE VAPORIZATION INTO POTENTIAL ENERGY, assuming that the elevation is SUFFICIENTLY HIGH to convert all available heat to potential energy (which is mechanical form of energy) –A DEED WHICH IS ABSOLUTELY PROHIBITED BY THE LAW OF THE ENTROPY, BUT, IS WELL ALLOWED and UNIVERSALLY PRACTICED BY THE NATURE and that is NOT IN THE NANO VOLUMES OF BOLTZMANN BUT, IN THE GIANT ATMOSPHERIC VOLUMES, WHICH DRAMATICALLY DEFY THE LAW OF ENTROPY THERE BUT, NOT OUTLAWING THE ENTROPY CONCERNING THE AIR, THUS, ALLOWING SIMULTANEOUS INDEPENDENT EXISTENCE OF THE ENTROPY AND THE BEZENTROPY, DUE TO THE FACT THAT SAID 'AGGREGATE STIMULUS' DOES NOT BOTHER THE DISORDERED MOLECULAR MOVEMENTS OF THE AIR, WHILE IS RECTIFYING THE DISORDERED MOLECULAR IMPULSES OF THE VAPOR INSIDE SAID MICRO BUBBLES INTO A COLINEAR ORDER of the ELEVATION, hence, in that remarkable tolerance is seen another GREAT WISDOM of Mother Nature, protecting all living being from lack of oxygen, for should the air on earth was MONODIRECTIONALLY ORDERED, like the GASEOUS RINGS of SATURN, there would be no global atmosphere for the living beings and finally: the physical dividing line between the ENTROPY and the BEZENTROPY is between the DISORDERED and the ORDERED molecular movements of the gases and steams, while the MATHEMATICAL dividing line between them is between the two classes of the differential equations of the heat, where the FIRST CLASS –all of them partial differential equations converted to artificial total differential during their mathematical or physical integration– is governing the DISORDERED MOLECULAR MOVEMENTS of the ENTROPY, valid for all classic heat engines, where said artificial intervention leads to the ENORMOUS ENTROPIC LOSSES OF HEAT OF ALL CLASSIC HEAT ENGINES, STEMMING FROM THE DISORDERED MOLECULAR MOVEMENTS LEADING TO THE REDUCED QUANTITY OF HEAT dB of CLAUSIUS and of the differential equation dS of the ENTROPY, both having one and same numerical values but, different physical meaning and dimensions, since dB is reduced heat energy, while dS is 'heat divided by temperature', while the SECOND CLASS –OF THE BEZENTROPY– consists only of NATURAL TOTAL DIFFERENTIAL EQUATIONS OF THE HEAT ENERGY like the LATENT HEAT OF THE VAPORIZATION, THE ENTALPY and THE HEAT OF CONDENSATION, all allied with the STIMULATED SPONTANEOUS BEZENTROPIC ORDER OF IN THE UNIVERSE and with the particular BEZENTROPIC DEVICES which are physically promoting that order, on which rely all BEZENTROPIC HEAT ENGINES of this invention, working the following way:

(g-2) for that success I followed the above mathematical and physical properties, characteristics and mandates

of the law of bezentropy ALLOWING DIRECT INTEGRATION AND FULL CONVERSION OF THE HEAT ENERGY TO MECHANICAL FORMS OF ENERGY, meaning to POTENTIAL and KINETIC ENERGY and to WORK, thus, guided that way I decided to imitate the rain, the waterfalls and the existing TERMO-HYDRAULIC POWER PLANTS (which are fully Bezentropic), in a better way, by replacing the water, the water vapor and the waterfalls with FREON, FREON VAPOR and FREONFALLS, the advantage being that when is practically impossible to erect artificial mountains and waterfall (to replace the polluting Thermal Power Plants), it is possible to imitate them with the help of the freon since FREON'S LATENT HEAT OF VAPORIZATION, at room temperature, is not 600 kcal/kg, like that of the water but, only about 30kcal/kg, which is 30 times lesser, and therefore that would require 30 times less high mountain to condense, by vertical elevation and cooling the freon vapor to LIQUID FREON capable to create artificial REONFALL capable to rotate a A NEW FREON GENERATION OF "TERMO-HYDRAULIC" POWER PLANT, another help for that being that: at room temperature, the freon is about 1-350 times heavier than the water, meaning that the required mountain (to create enabling FREONFALL) would be sufficient to be 50 to 100 meters high (which is less that 1/3 from that of the EIFEL TOWER) and can be imitated by a simple TUBULAR TRIPOD, whose two tubes can be used to elevate (50 to 100 meters or more) the freon vapor and the third to imitate the freonfall, thus, to produce that way even FREE ELECTRICITY because, similarly to the natural vaporization of the water (creating the free of charge rain and waterfalls) the freon does not need heat from combustion to get evaporated (its boiling temperature is -30°C and yields about 5-788 atmospheres pressure at room temperature of 20°C) capable to support, when desired, much higher than 100 meters elevations, for example at dry mountains to create there the artificial FREONFALLS, and also to accelerate the condensation of the freon vapor (in order to increase the power of the plant) one could employ at the top of the TRIPODS also COOLERS which would not make that electricity more expensive (than pure air) because, the heat needed to boil the freon to FREON STEAM is FREE OF CHARGE HEAT taken from the air, exactly LIKE MOTHER NATURE IS DOING THAT TO CREATE THE WATERFALLS and more: one may regard the electricity as produced by a FREONFALL PLANT as a FUSION TYPE NUCLEAR REACTOR because, the heat of the air used there to boil the freon of such power plant is actually SUN ENERHY -harvested without sun collectors and photocells, performed simply by a FAN blowing the air, days and nights, inside the FREON BOILER- and because, the sun which is the actual generator of that heat is actually a natural safe and eternal controlled thermo-nuclear reactor, while the other detail of the BEZENTROPIC FREONFALL POWER PLANT consists of a good, air to freon, heat exchanger designing it to

work into closed circuit system, while another member of the plurality of the BEZENTROPIC POWER PLANTS is described in

(g-3) dealing with the direct conversion of the HEAT into LINEAR KINETIC ENERGY, which is then converted to ROTARY KINETIC ENERGY, TO WORK AND TO ELECTRICITY, and this turbine can work either by a closed circuit FREON CYCLE or as open circuit WATER TURBINE, following again the LAW OF THE STIMULATED MOLECULAR ORDER, existing abundantly in the universe (named shortly the LAW OF THE BEZENTROPY) where for 'Bezentropic Devices' –stimulating the MOLECULAR DISORDER into MOLECULAR ORDER of colinearly oriented VECTORS of molecular impulses– are used the NOZZLE of LAVAL (using the the first and the second laws of Bernoulli described in the accompanied disclosure) and my –more suitable– VARIABLE FLAT NOZZLE, based on the same laws of BERNOULLI, combined with my bladeless bezentropic turbine, stators and rotors, invented when in the beginning I noticed that Laval (and all other engineers and scientist to present) missed to realize that Laval's excellent nozzle (invented in 1883 as part of his, first in the world, one stage steam turbine) is GENUINELY DEFYING THE LAW OF ENTROPY, and that historical neglect then was repeated to present, since no one has a CONCEPT about the decisive colinearly STIMULATED ordered molecular movements of the gases and the steams, explaining why Laval's and all other classic turbines are very inefficient following the inefficient law of the ENTROPY, not allowing to see that the guilt for said inefficiency belong to the thousands turbine blades fixed upon the STATORS and the ROTORS of the classic turbines, on account of which: whenever an ORDERED (by the nozzle of Laval) MOLECULAR JET IS DIRECTED TO THEM, SAID TURBINE BLADES INSTANTANEOUSLY DESTROY THE CREATED (BEZENTROPIC) ORDER and SUBMIT THE TURBINES BACK TO THE MISERABLE DISORDER OF THE ENTROPY, IMPOSING ITS INEFFICIENCY OF ENERGY CONVERSION hence, due namely to that vacuum of knowledge, when in 1883 S. PARSONS invented the Multistage Steam Turbines, and when in 1905 NICOLA TESLA invented the GAS TURBINES, the same ERROR was repeated, and the error is corrected only now, by this invention, which finally explained why the NOZZLE of LAVAL is capable to converts the heat content (the ENTALPY) of a gas or steam, DIRECTLY and FULLY into LINEAR KINETIC ENERGY (which is MECHANICAL and not HEAT energy) doing that by UNIQUE EFFICIENCY of 99% and why when such excellent nozzle is attached to the turbine of Laval, the combined efficiency go down to the miserable efficiency of 25% and why the same RIDDLE is occurring also with all classic turbines; and when the good fortune elected me to solve that riddle I invented, the claimed, first in the world, TURBINE WITHOUT TURBINE BLADES and named it BEZENTROPIC TURBINE for direct and full conversion of the ENTALPY

to KINETIC ENERGY and WORK, having:

a cylindrical stator -not having even a single turbine blade- housing an also bladeless rotor, having instead of blades -stretched, side to side- 2 symmetric involute (evolvent) type canals starting upon the axle-tree, of the rotor, and ending at the circular periphery of the rotor, where said rotor and stator have also side walls, each of them having two or more symmetric openings, around the axle-tree, where the axle-tree of the rotor is suspended inside the stator by suitable bearings fixed in stator's side fenders, and to the outside cylindrical surface of stator's body are fixed 2 opposing FLAT and VARIABLE CONVERGENT-DIVERGENT NOZZLES, to blow in said rotor's 2 symmetric spiral canals 2 jets of steam at supersonic velocity, the jets at such speed actually being PURE LINEAR KINETIC ENERGY -WHICH IS MECHANICAL FORM OF ENERGY, OF ORDERED MOLECULAR IMPULSES AND NOT HEAT- all that meaning that due to the supersonic velocity caused by said laws of BERNOULLI (working inside any nozzle producing supersonic jet), whenever at the input of the nozzle of Laval or of my flat variable nozzle is inputted heat, at their outputs is obtained solely 'linear kinetic energy' and due to that material fact, the new Bezentropic turbine -working by an OPEN THERMO MECHANICAL and NOT BY THERMODYNAMIC CYCLE- is not a truly heat engine but rather a mechanical one, something like the hydraulic turbines, HAVING NOTHING TO DO WITH THE CYCLE OF CARNOT AND ITS MISERABLE EFFICIENCY, where the role of said spiral canals is TO PRESERVE THE MOLECULAR ORDER OF THE JET DURING THE CONVERSION OF ITS LINEAR KINETIC ENERGY TO CIRCULAR (ROTARY) KINETIC ENERGY, BY THE ROTOR, WHICH CIRCULAR ENERGY IS ACTUALLY WORK, AFTER WHICH THE STEAM LEAVES THE TURBINE (THROUGH SAID OPENINGS AROUND THE AXLE-TREE) another detail of the turbine being its steam generator which, according to the particular case, is chosen among the plurality of the steam generators, of this invention, such as the classic steam generators, the nuclear steam generators, the freon steam generator or, the special steam generator (described further in this claim) where the steam is generated by direct contact with hot combusted gases, described in the following

(g-4) BEZENTROPIC TURBINE using as working body GAS AND STEAM BLEND where the entalpy of the generated gas and steam mixture is converted, again directly and fully, first into to KINETIC ENERGY, then, to CIRCULAR ENERGY and WORK, following the law of the Bezentropy and defying the law of the entropy, on account of the same as above stated material fact that: whenever ENTALPY (the heat content of the working gasiform body) is inputted to the input of the NOZZLE of Laval -or, in the VARIABLE FLAT NOZZLE of the invention- at the OUTPUTS of these nozzles appear only LINEAR KINETIC ENERGY

WHICH IS MECHANICAL FORM OF ENERGY AND NOT HEAT; hence the DIRECT SOURCE of the work performed by the rotor of the bezentropic turbine is NOT HEAT but, THE MECHANICAL KINETIC ENERGY OF THE JET whose molecular order is protected from going into disorder by the smooth spiral canals of the rotor till the full conversion of the HEAT INTO WORK meaning that the high efficiency of the Bezentropic Turbine is INTRINSIC, due to the material fact that the heat to work conversion there is actually conversion of one form of mechanical (kinetic) energy to another form of mechanical (rotary) energy which in accordance with the theoretical physics ALWAYS FULLY CONVERTS ONE INTO THE OTHER and as result of all that the KNOWN efficiency limitation valid for all classic heat engines

$\eta = (T_2 - T_1)/T_2$, where $T_2 > T_1$, imposed by the CYCLE of CARNOT (from which Clausius deducted also the law of ENTROPY) is simply not valid for the bezentropic turbines because, (like the electric motors and the hydraulic turbines) they are not using any known thermodynamical cycle; consequently, the EFFICIENCY of the bezentropic turbines is same as that of the PELTON type of hydraulic turbines –using essentially the SAME BEZENTROPIC THERMO-MECHANICAL CYCLE– given by the mathematical expression

$\eta = m/2(W_1^2 - W_2^2)$ where $W_1 > W_2$ are the velocities of the inputted and the outputted jets of the turbines, evidently meaning that when –due to the performed work– the velocity W_2 of the jet –outputted from the turbine– becomes 5 times diminished (compared to the inputted velocity) the exhausted energy losses becomes 25 times smaller –or only 4% from the inputted, by the nozzle; kinetic energy thus, allowing 96% efficiency of the turbine and that is realistic because, such efficiency is well attained by the good hydraulic turbines, the other turbine's details being:

a two stage Bezentropic Compressor whose rotor and stator have a construction similar to the turbine described in (g-3) providing the necessary air to the combustion chamber of the turbine, where such compressor has the advantage of providing DYNAMIC PRESSURE instead of STATIC PRESSURE, thus, avoiding the otherwise inevitable water cooling and thermal losses existing in the ordinary air compression and said advantage comes again from rotor's spiral construction, since it is working both like a rotating piston and as centrifugal compressor, creating said dynamic pressure of air; then, inputting it in the long tubular combustion chamber of the turbine, through a nozzle of laval, fixed between the output of the second stage of the compressor and the combustion chamber, another task of same nozzle being to facilitate sucking the needed natural gas by the divergent section of said nozzle and a controlled variable gas valve, mixing the air with the fuel and sending it to the water cooled continuous combustion chamber having a

spark plug for initial ignition and another nozzle of Laval at its other end where in the divergent section of that nozzle is sprinkled hot water taken from the water cooling of the combustion chamber, which water instantaneously flashes into preheated steam since is there directly contacted with the already fully combusted mixture of natural gas and air, after which the steam and gases mixture is directed to a distributing pipe feeding the FLAT VARIABLE CONVERGING-DIVERGENT NOZZLE(S) of the turbine based, like the nozzle of Laval, on the same 2 laws of BERNOULLI prompting to create from the gases and steam mixture of DISORDERED molecular movements a FLAT SUPERSONIC JET of INTEGRATED MONODIRECTIONAL ORDERED MOLECULAR IMPULSES, thus converting the ENTALPY of the of the hot 'gases and steam blend' FULLY INTO LINEAR KINETIC ENERGY of the JET, blowing it inside the SMOOTH SPIRAL CANALS of the rotor of the turbine, which are protecting the bezentropic order of the molecules till the full conversion of said kinetic energy into work, by converting the KINETIC ENERGY, of the jet, into CIRCULAR ENERGY by the rotor, which purely mechanical process tantamount to WORK, which is then converted to electricity through an electric generator connected with the turbine, synchronized by frequency and phase with the other national power plants for parallel work with them; while another design within the PLURALITY of the BEZENTROPIC TURBINES helping to clean the ENVIRONMENT is

(g-5) a similar to the above bezentropic turbine, capable to convert directly and in full the ENTALPY of the working body into KINETIC (instead of potential) ENERGY but, using FREON STEAM as working body, working into a CLOSED CIRCUIT SYSTEM, not needing compressors, combustion chamber and heating by fuel, since its freon boiler is heated by my MODIFIED BEZENTROPIC VORTEX TUBE playing much better the role of the knowing HEAT PUMP (using the reversed thermodynamic CYCLES introduced by the end of the 19 century by J.J. THOMSON) which are capable TO STEAL HEAT from the atmospheric air by an efficiency of over 100% practically to no more than 140% meaning that when one spends 100 kcals for electric energy to rotate the heat pump, he is obtaining as result of that 140 kcals heat which look excellent but it is impossible to use it for generation of fee fork to rotate the heat pump or for any other purpose (which does not contradict the ENERGY CONSERVATION LAW because the heat pump does not create energy but, simply steal existing heat energy from the air) because: when one attempt to convert said 140 kcals of heat to work the result is catastrophe even if try to input that heat in a hypothetical classic heat engine having the maximum possible efficiency of the Diesel engine attaining 40% because, $140 \text{ kcals} \times 40\% = 56 \text{ kcals}$ while the originally inputted heat (to rotate the heat pump) is 100 kcals.,

and it is impossible to reverse the situation even if it was possible to build for the purpose the hypothetical engine of CARNOT having the imaginary efficiency $\eta = (T_2 - T_1)/T_2$ where $T_2 > T_1$ and combine it with a best imaginary heat pump based on the REVERSE hypothetical CYCLE of Carnot having the efficiency $\eta_p = T_2/(T_2 - T_1)$ the result would be also catastrophic because: the efficiency of such heat pump is just RECIPROCAL to the efficiency of Carnot cycle at any temperature difference, hence, what is gained by such classic heat pump would be canceled by the cycle of Carnot,

HOWEVER, that situation becomes completely different when one forgets the CLASSIC THERMODYNAMICS and switches to the BEZENTROPIC THERMODYNAMICS because, a good bezentropic vortex tube used as heat pump (such as the hereinafter disclosed one) may well (practically) attain 200% of more efficiency and a good Bezentropic Turbine working by FREON TYPE closed circuit, may well convert the heat into work even by an efficiency of over 100% since, like said VORTEX TUBE HEAT PUMP, such turbine is also capable to steal additional heat from the environment, the details of all that being the following:

the original VORTEX tube (discovered by chance in 1928 by the French physicist George RANQUE) is capable to separate the hot from the cold molecule of any gas or steam and is working by creating two opposing coaxial traveling air vortices (spirals), one of them looking like a vortex (tornado) tube of air (inserted in the metal tube) meeting a half opened CONICAL VALVE at the end of the metallic tube which is back returning half – or so – of the tornado thus creating a back traveling tornado jet inserted in the vortex air tube, where the inner traveling vortex (tornado, air spiral) releases much of its heat content to the wrapping it, traveling in opposing direction air spiral, on account of which the end of the metallic tube exhausting the inner vortex jet springs very COLD AIR while its opposing end exhausts very HOT AIR, all happening by converting the DISORDERED molecular movements, of the air, into CIRCULAR ORDERED movements, originating initially by the vortex chamber of the tube –where an air jet blows tangential inside the chamber– but, regardless of the so strongly pronounced circular molecular order there, no one to present was able to see that this is a BEZENTROPIC DEVICE because, no one prior to this invention had ever idea of bezentropy and why no one was able to see it notwithstanding that it is so widely existing in the world, so far, apart from all above, the vortex tube requires a minimum of 4 to 6 atmospheres of pressure to start working properly, most of which pressure is exhausted as unused kinetic energy, when one uses the tube either for cooling or for heating purposes, making it very energy inefficient; hence, seeing all that I improved and upgraded it to become very practical for this invention as

follows:

(1) the original (less effective) cylindrical chamber of the air rotation, of the vortex tube, has been changed to a combination containing: a flat nozzle (similar to the nozzle of Laval) to increase the velocity of the air coming from the compressor, blowing its air jet inside a 'spiral shaped chamber', causing the jet to circulate inside there, in order to increase its circular momentum, then,

(2) I added to the axle-tree of the electric motor –rotating the compressor of the vortex tube– a small bezentropic turbine, working by an air jet coming from the COLD END of the vortex tube –when the vortex tube is used only as a HEAT PUMP– or, alternatively, with air from the HOT END of the vortex tube –when the tube is used only as a cooler– the purpose of that small turbine being to recuperate the KINETIC ENERGY exhausted either by the not used HOT or COLD end of that tube and add that ENERGY to the axle-tree of the ELECTRIC MOTOR, driving the COMPRESSOR of the tube, in order to reduce its electric energy consumption, while the air input of said small turbine shall be disconnected from both ends of the vortex (tornado) tube when that tube is used simultaneously for heating and refrigeration purposes for home, business and in the industry, doing all above very inexpensively –due to said upgrading– since starting with room temperature of 20°C, for example, one may obtain down to –50°C COLD AIR –at the cold end of the vortex tube and up to + 150°C HOT AIR –at its hot end– that is without help of FREON, which is absolutely not possible with any classic heat pumps, FURTHERMORE, in the following examples

(3) the hot end of the vortex tube is used to boil a FREON BOILER of up to 100°C or more in order to obtain large amount of preheated FREON STEAM, of high pressure, capable to drive –in freon closed circuit mode– a powerful freon type of Bezentropic Turbine, having the purpose to extract large amounts of free heat, work and electricity from the atmospheric air, also from industrial chimneys and from the hot springs, working as follows:

the freon boils at –30°C, at room temperature it develops a pressure of 5.785 ata (kg/m^2) and obtains enthalpy (heat content) of its steam equal to 139.12 kcal/kg, specific density 31.52 kg/m^3 and latent heat of vaporization equal to 34.56 kcal/kg, where said ENTHALPY and 'latent heat of vaporization' are obtained FREE OF CHARGE from the ATMOSPHERIC AIR and can be used as any other portion of heat;

MOREOVER, since the disclosed vortex tube is capable to extract more free of charge heat from the atmosphere, than any classic heat pump and at much higher temperature, consequently, if one decides to use the vortex tube to evaporate the freon to preheated freon steam one could steal heat from the air both through the vortex tube as an efficient

heater and from the low boiling temperature of the freon creating a large temperature gradient between its boiling temperature and that of the air, also heating the freon boiler; for example combined heating even at only 50°C yielding: pressure = 12·405 ata, specific density = 68·69 kg/m³, enthalpy 141·71 kcal/gk and latent heat of vaporization = 29·79 kcal/kg and these data should still be more favorable to extract free energy from the air where the temperature of the freon boiler attains 100°C or more, at no cost, using the upgraded vortex tube of the invention where the considerable kinetic energy of the cold end of the vortex tube is recuperated and back utilized, as above stated, and because the even more free cold air is obtained at the output of the small kinetic energy recuperating turbine which can be reasonably used to fasten the condensation of the freon steam in order to increase the power of the power plant, where the so generated large amount of steam is sent to the 'flat, variable and converging-divergent nozzle' of that large freon turbine of same construction described in (g-4) which in this case accelerates freon steam to supersonic velocity and blows it inside of its spiral bezentropic rotor to rotate it and perform the desired free of charge work, the rotor strips the freon steam from its energy, due to the performed work, after which it is easy to condense to liquid freon and pumped back to the freon boiler to start a new THERMO-MECHANICAL WORKING CYCLE, which turbine essentially has the same general construction as that described in (g-4) but, does not have the described there the 2 stage compressor, because don't need it, another difference being that this freon type bezentropic turbine uses actually 2 independent but simultaneously working cycles: one open air cycle used by the vortex tube having the task to extract free heat, at high temperature, from the atmospheric air and use it to heat the freon boiler, representing a heat exchanger, in order to generate the desired freon steam, and a second 'closed freon circuit cycle' of the working turbine, another remarkable detail there being my ELLIPTIC COMPRESSOR, described in the disclosure of this invention, delivering 5 to 8 atmosphere compressed air to the vortex tube, where the main reason for choosing that elliptic construction is because: it is the only one high technology achievement ALLOWING ZERO TORQUE AT MAXIMUM COMPRESSION, THUS, ALLOWING TO ROTATE IT SMOOTHLY BY SMALLER EFFORT AND START IT BY RELATIVELY SMALL (STARTING ONLY) ELECTRIC MOTOR, UNTILL THE DESCRIBED 'MAIN FREON TURBINE' STARTS TO GENERATE ENOUGH ENERGY TO ROTATE BOTH THE ELLIPTIC COMPRESSOR AND THE ELECTRIC GENERATOR, GENERATING THE DESIRED FREE BEZENTROPIC ELECTRICITY and of course when desired, one may use also some fuel to heat the freon boiler for more power, while another important member of the bezentropic plurality is

(g-6) the following modification of the above bezentropic turbines and the upgraded

vortex tube aiming to eliminate the air pollution and the low energy efficiency of the classic JET PROPULSION system and replace it with the ZERO POLLUTING and more efficient VORTEX PROPULSION SYSTEM based: (a) on replacement of the polluting hydrocarbon fuel by my less expensive and zero polluting IONIC FUEL, (b) on replacing the LINEAR KINETIC ENERGY $E_L = m/2 \cdot W^2$ of the propulsion by the more efficient CIRCULAR (ROTARY) KINETIC ENERGY $E_R = 1/2 \cdot \Omega^2$ (where Ω = angular velocity and I = moment of inertia) which energy is easily lowered almost down to zero by the time when the CIRCULATING IONIC TORNADO leaves the funnel (cone) of the propulsion SINCE ALL ENERGY OF THE TORNADO GOES TO PROPEL THE AIRCRAFT VEHICLE and (c) on complete construction change of the classic jet propulsion system to suit the requirements of (a) and (b) all working as follows:

a difficult task for propelling any aircraft or space vehicle is to find out a good replacement of the solid ground (the roads, railroads) against the engines push and moves the terrestrial transportation vehicles; however, that does not exist in the atmosphere, nor in the space and that is why the classic JET PROPULSION replaces them by pushing and accelerating the the space and the air vehicles, against jet propulsion's own gaseous JET WHICH IS VERY POOR CHOICE since the DIFFERENCE between rapid gas flow (jet) and SOLID WALL is as big as is the distance between the earth and the moon; hence namely due to that difference the efficiency of the jet propulsion is very very low, causing the combustion of thousands of metric tons of fuel and enormous air pollution, telling that one must invent something else to reverse the bad situation, hence what I did to obsolete the poor jet propulsion system with a more ecological and inexpensive system the following:

(1) my clean IONIC FUEL suitable for vortex propulsion is the NASCENT HYDROGEN derived 'IN CITU' from cracking ammonia or ammonium nitrate, in electric arc or by thermal cracking, for it requires about 30 seconds for back recombination of its ions back in molecular state, which time is more than necessary to create an IONIC TORNADO (vortex) through circulating the plasma by rotating magnetic field, similar to already practiced in the INDUCTION ELECTRIC MOTOR and having this way an IONIC VORTEX PROPULSION SYSTEM, or, in the alternative, separating the ions of the nascent hydrogen from the nitrogen by positively charged electrode and combusting the nascent hydrogen with air or oxygen performed inside of 2 separate combustion chambers: one of them belonging to the BEZENTROPIC TURBINE –rotating a bezentropic compressor– and the other blowing the obtained super preheated steam inside the spiral vortex chamber from where it enters in the VORTEX PROPULSION CONE (FUNNEL) –of sufficient length and divergence– to house the powerful vortex tornado performing the propulsion by its centrifugal force pushing the

the funnel forward, until its rotary energy is fully consumed and then, approaching the output of the funnel the tornado, having no more energy, is exhausted in the atmosphere, thus guaranteeing the desired maximum propulsion efficiency, the other details of the system bein:

a second (not conical, normal) vortex tube, similar to that described in (g-5) the hot end of which is used to supply both combustion chambers with (preferred) hot air, while to start working this vortex tube is supplied with 5 to 8 atmospheres pressured air – coming from said bezentropic compressor, rotated by the turbine– and the cold end of the vortex tube, blowing cold air is used for air cooling of both combustion chambers, since the water cooling is not practical for aircraft vehicles, and because the vortex propulsion is not at all counting on blowing out powerful gaseous jet in order to fly an aircraft, the vortex propulsion funnel may well function in closed circuit of fluid –which in such condition is better to be liquid fluid– circulated by a pump driven by the same ionic turbine, and that would lead also to size reduction of the vortex propulsion system, while another upgrading of the vortex propulsion being when the vortex propulsion funnel is using directly the IONIC FUEL, the improvement consisting of ROLLING AROUND THE INPUT of the vortex propulsion funnel a rotating magnetic field –similar to that of the induction motors – but of much higher frequency– in order to further increase the centrifugal force of the ionic circulation, which would be well practical, for, as said, it takes about 30 to the ions to recombine into neutral molecules, thus converting the regular vortex propulsion into ionic vortex propulsion; finally, because the phenomenon of the BEZENTROPY includes also the very fast BROWNIAN MOVEMENT OF THE ELECTRONS IN THE METALS, and especially in the SUPER CONDUCTORS, the next bezentropic device of the plurality is

(g-7) a SUPER CONDUCTING bezentropic device for converting the kinetic energy of electrons' brownian movement DIRECTLY TO ELECTRICITY working as follows:

to the magnetic core of an electric transformer is added a strong permanent magnet –made from NYODYUM (Nd) alloy– where the first and the second coils of the transformer are made from ROOM TEMPERATURE SUPER CONDUCTING WIRE –presently of superconductor cooled by liquid Nitrogen– where the first coil is short circuited and the second is bridged by a variable condenser, needed to obtain there a resonant circuit, since in such conditions the magnetic field restricts the Brownian movements of the electrons by forcing them to vibrate only into one direction; and that creates a direct current modulated by the alternative current generated by the 'resonant circuit' of the second coil, hence, in such particular conditions, it becomes possible to extract alternative current caused by the concurrent action of the Brownian motion of the electrons and said strong magnetic field

because: the first coil is continuously resupplying the resonant circuit with energy needed to support the vibration of the resonant circuit and additionally to that, such energy is generated by the Brownian motion of the electrons, which due to the permanent magnet change their DISORDER into strong bezentropic ORDER and MORE: additionally to all above electricity from the Brownian movements of the electrons can be obtained also by regular copper or silver wires and coils if in the same transformer is used only one of its two coils in condition that the used coil is connected with a rechargeable battery (to compensate the resistance of the coil, stopping the current of the Brownian motion) and when the polarity of the battery follows the polarity of the current obtained from said ordered motion of the electrons, hence, as a result of all that, the energy efficiency of the battery becomes increased due to the extra electricity derived by stimulating the originally disordered into ordered through said strong magnetic field,

Claim 15

The method of prospecting and mining 'in situ' the solid gas hydrates of Claim 14 for production of natural gas from them, where the method is based on underground electrical explosions through electric short circuits at the bottom of the sea where the solid gas hydrates usually are found, for which the deep underwater electric explosions are performed inside of suitable 'frog man's like BELL' to provoke simultaneous liberation and collection of said natural gas liberated from said mechano-electrical destruction of the gas hydrates, sometime containing also hydrogensulphide, and send that gas to the exploring sea platform through suitable hose of large cross section,

Claim 16

The non polluting process of Claim 14 used for manufacturing of not expensive, pure and not explosive (quieted) hydrogen plus by-produced oxygen, obtained indirectly from said natural gas as well as also from the very polluting hydrogensulphide, doing that without emission of smoke, carcinogens, other pollutants and not even CO₂, where: for that environmental purpose, all natural gas and the hydrogensulphide are burned, in the presence of limestone gravel, in the fluidized bed combustion -of power plant's steam generator- thus, converting the sulfur of the hydrogensulphide to the absolutely neutral and valuable gypsum -used concurrently in the fertilizers, as soil stabilizer, and in the masonry- while the obtained steam is used in the hyper efficient BEZENTROPIC POWER PLANT of Claim 14, to produce the needed inexpensive electricity, while the CO₂ produced during the combustion is separated from the accompanied NITROGEN and the noble gases, then is piped to the sea, where it combines with the alkaline earth ions of the sea water and get into sedimentation, while said nitrogen and noble gases are blended with 4% to

40% inexpensive hydrogen –obtained from electrolysis of the water, by the three times or less expensive electricity obtained from the bezentropic power plants of Claim 1– (by-producing that way also valuable OXYGEN) and converting that way the hydrogen to 'quiet', non explosive, safety hydrogen, which after that can be safely pumped for chemical synthesis, for other industrial applications, for homes heating and as fuel for transportation vehicles, especially when is delivered to hydrogen tank containing carbon nano tubes –as best reservoirs for the hydrogen– and as fuel for fuel cells for the emerging electric cars,

Claim 17

That novel part of Claim 14 used for manufacturing of ACETAL FUELS, SOLVENTS and ANTIKNOCKS out of the natural gas, via catalytic partial oxidation of the natural gas and from other hydrocarbons, especially from these of my FUEL ALLOYS, performed with insufficient oxygen or air, at temperature of $450^{\circ}\text{C} \pm 20^{\circ}\text{C}$ in water cooled tubular reactor and in the presence of 99-999 % pure electrolytic copper as catalyst, in shape of wire spiral or granules, when this way is obtained a master intermediary mixture of lower aldehydes, alcohols and trace amount of Ketones, which when cooled down to 60°C is transferred into another water cooled reactor and there, in the presence of another catalyst, is converted to an excellent "bouquet" of acetals, which do not need to be separated one from the other because, that blend is excellent non polluting ecological fuel of high octane number "as is" for cars, not requiring any changes upon the cars to be used there, the same acetal blend being also excellent antiknock for improving the classic varieties of the gasoline and as eco solvent for paints, where the mentioned second catalyst of the process represents the plurality of the acidic ion exchange resins and natural or synthetic zeolites, doped with CaCl_2 and because, said 'master mixture' contains twice as much aldehydes than the alcohols to produce the acetals, the remained excess of aldehydes are passed, at room temperature, through the synthetic zeolite catalyst SZM-5 which converts the aldehydes to lower hydrocarbons, such as pentane, iso-pentane and hexane, which mixture is aviation kind of gasoline of very low pollution not containing carcinogens, convertible even to better fuel by blending it with acetals of the same process, and for that purpose said acetals shall not contain more than 8 % water to prevent the separation between them and the gasoline,

Claim 18

All catalysts of claim 14 whenever they are used to manufacture acetal fuels and solvents and for synthesis of gasoline from the aldehydes,

Claim 19

The underwater electric explosions and the 'frog men's bells' of Claim 14 used for geologo-geophysical prospections and "in situ" mining for gas hydrates, other clathrate compounds, natural gas and hydrogensulphide,

Claim 20

The plurality of the BEZENTROPIC POWER PLANTS of Claim 14, without which this ecological invention is impossible since otherwise cannot afford economical feasibility, where in claim 14 the members of said plurality are specifically identified such as (g-2), (g-3), (g-4), (g-5), (g-6) and (g-7),

Claim 21

The bladeless bezentropic stators and rotors of the plurality of the bezentropic turbines and compressors, of claim 14, using empty cylindrical shaped stators constructed that way to house the bezentropic rotors, each of them being a reel like device on which are involutely (evolvently) coiled and welded 2 or more steel sheet metal, distanced each from the other in away to create spiral canals between them designed to blow in them a working body -steam and/or gaseous- blown there from the claimed 'flat, variable convergeing-divergent nozzle' of the invention,

Claim 22

the modified and upgrade vortex tube of Clain 14 designed for member (g-5) of the plurality of the bezentropic turbines using -differently from the 1928 classic vortex tube of George Ranque- a better vortex chamber having a spiral canal (air duct) where at its input is fastened a flat converging-divergent nozzle blowing air inside the spiral canal from a better bezentropic compressor, combined also with an air blown small bezentropic turbine attached to the cold end of the vortex tube when is used only its hot end, the purpose of that being to recuperate the considerable linear kinetic energy of the cold end, which otherwise is lost and to reattach same small turbine to the hot end of the vortex tube when is used only its cold end, same turbine having the same purpose of energy saving for which it is directly connected with the electric motor rotating the compressor,

Claim 23

The BEZENTROPIC VORTEX PROPULSION SYSTEM of Claim 14, and its ionic fuel -obtained as nascent hydrogen from cracking ammonia and ammonia compounds- described more particularly as member (g-6) of the plurality of the clean bezentropic turbines, having the purpose to replace the present inefficient and polluting JET PROPULSION SYSTEM, doing that by replacing the LINEAR KINETIC ENERGY of the propulsion by the more advantageous CIRCULAR (ROTARY) KINETIC ENERGY of the gaseous working body where that body propels the aircraft by pushing through its enormous

centrifugal force the VORTEX PROPULSION FUNNEL OF THE AIRCRAFT which must be of sufficient length so at approaching the output of the funnel the rotating working body to have exhausted all of its circulating energy thus exhausting in the atmosphere gases completely stripped from its –supplied by the fuel– kinetic energy, all meaning that the VORTEX PROPULSION SYSTEM is not propelling the aircraft vehicles pushing it irrationally against jet of gases but, much more efficiently AGAINST THE SOLID CONICAL WALL OF ITS OWN VORTEX PROPULSION FUNNEL, which make the system completely independent from propelling by pushing against outside wall or jet which is an important property allowing the vortex propulsion to work by fluid in closed circuit and thus to minimize the size of the system by choosing for working body suitable liquid circulated a powerful bezentropic turbine and pump, useful both for space and terrestrial purposes,

Claim 24

The special synchronization system of the bezentropic turbines of Claim 14, allowing them to work in parallel with the city electric system, consisting of a small synchronous servo motor connected to the city power supply rotating a plastic ring around the axle-tree of the turbine but, independent from the rotating of the axle-tree, having a series of about 7 photo diodes (PhD) in tandem one next to the other, all facing a coaxial inner plastic ring, rotated by the axle-tree of the turbine, having a light emitting diode (LID) facing said series of photo; hence, when both independent rings rotate by one and same RPM the light of the LID facing the central PhD sends a signal for that fact, which is then amplified and sent to the solenoid monitoring the fuel valve of the turbine "telling" the solenoid to keep steady its position because the RPM of the turbine is locked to the phase and the frequency –through said synchronous servo motor– of the city electrical system and alternatively, when the phase of that locking is changed, the LID sends a signal to another PhD and that PhD sends a signal to the same solenoid to correct the error by a new adequate position of the fuel valve,

Claim 25

The bezentropic extraction of energy from converting the DISORDERED Brownian movements of the free electrons found in the metals and in the super conductors into spontaneous colinearly ORDERED movements –stimulated for that by strong permanent magnetic field– rectifying the disordered electrons into direct current where for the purpose is used transformer whose magnetic circuit is fortified by a permanent magnet, having also a coil, from super conductor, plus a resonant circuit extracting the electricity from the super conductor and when instead a super conductor is used copper or silver conductor then, the coil of the transformer should be connected, in series of the polarity

of a rechargeable battery which that way is getting additional electricity from the rectified electrons,

Claim 26

The ELLIPTIC bezentropic compressor, needed whenever the bezentropic turbines of Claim 14 and Claim 20 are of small diameters, for in such conditions, the turbo compressors of small diameter cannot develop sufficiently high compression, without prohibitive high R.P.M.

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